國立成功大學

113學年度碩士班招生考試試題

編　號：66

系　所：機械工程學系

科　目：靜力學及專業英文
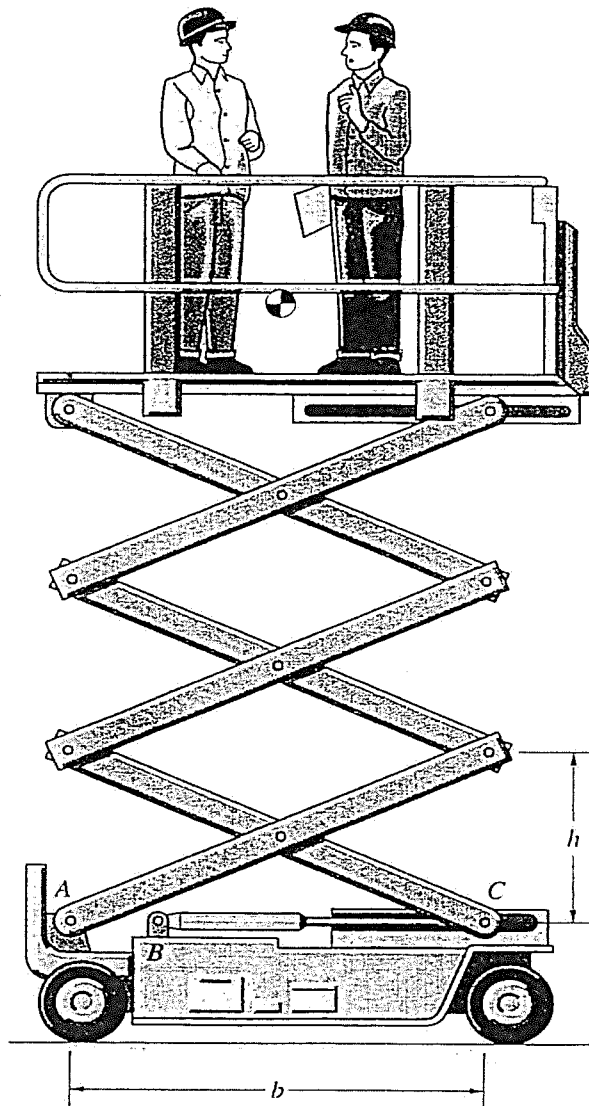
日　期：0201

節　次：第 1 節

備　註：可使用計算機

※ 考生請注意：本試題可使用計算機。　請於答案卷(卡)作答，於本試題紙上作答者，不予計分。
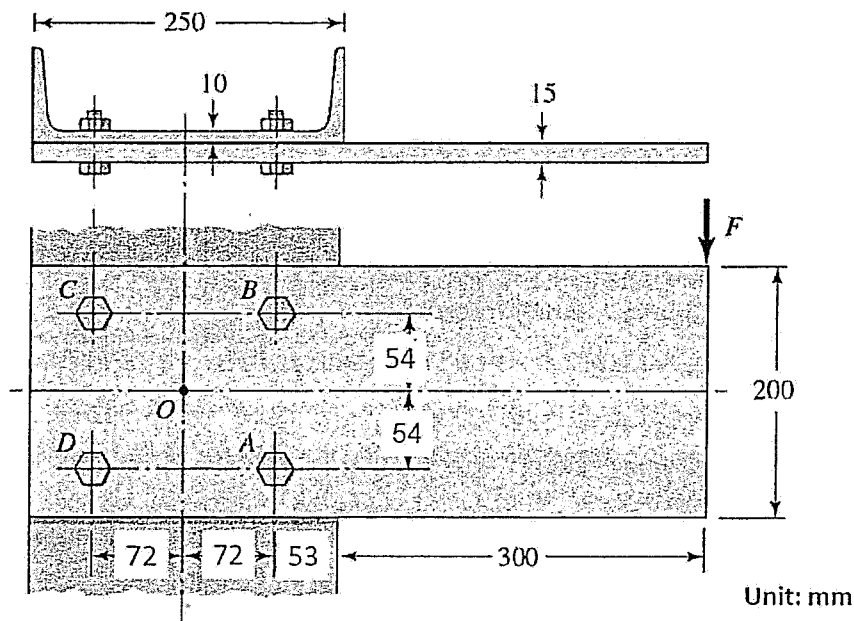
1. (25%) 請將以下中文翻譯成英文。

　(1) 螺絲、螺栓、鉚釘、彈簧、軸承、和齒輪都是常見的機械元件。

　(2) 一個造成降伏的過大負載會產生殘留應力，此殘留應力有利於同方向的未來負載，但不利於反方向的未來負載。

2. (25%) The extensible platform is raised and lowered by the hydraulic cylinder **BC**. The total weight of the platform and men is **W**; the weight of the beams supporting the platform can be neglected.　What axial force must the hydraulic cylinder exert to hold the platform in equilibrium in the position shown?

3. (25%) Four identical bolts (A, B, C, D) are used as fasteners in the bracket shown in the figure. (a) If the applied load *F* is 10 kN, calculate the equivalent torque and force at O. (b) Also, determine both magnitude and direction of the total shear force on these fasteners (A, B, C, D). (c) If each bolt can stand the 12 kN maximum shear force, find the maximum applied load *F* as shown in the figure.

Unit: mm

4. (25%) An uniform block of mass *m*, height *h* and base width *a* is kept on inclined plane as shown. The coefficient of friction between the inclined plane and block is *f*. The angle of inclined plane is then increased. (a) Draw the free body diagram for this uniform block. (b) Determine the conditions for the inclined angle value of θ so that the block does not tip over and slip. (c) If *a*=35mm, *h*=100mm and *f*=0.4, what is the limit value of θ without tipping over and slipping?.